



Promising Results

From tidal turbine testing at EMEC in Scotland

Delivering reliable and sustainable technology for the generation of energy from tidal currents is the primary objective of ANDRITZ HYDRO Hammerfest. Thus, in proving the functionality of the demonstrator device, the tidal turbine HS1000 at the European Marine Energy Centre (EMEC) is a major milestone in realizing the commercial potential of this technology.

The first machine of its kind, the HS1000, represents the forerunner of the commercial tidal turbines that will be installed in the near future in order to harness energy from strong water currents generated by the lunar tides (Hydro News 22). This machine was installed at EMEC's tidal test site in December 2011 and the installation was carried out in three stages, using a special offshore construction vessel in a 32-hour operation in the middle of

winter. With measured wind speeds exceeding 100 knots at times, meticulous planning was required to take advantage of each weather window as it was presented.

During the first 12 months of operation, the turbine underwent extensive testing, with particular focus on comparing measured loads and performances with figures calculated during the project design phase. Results were very positive, with the turbine performing as expected and loading remaining within the design envelope. Specifically, it was clear that the turbine could export in excess of 3 GWh to the grid annually.

Following this initial 12-month period, the turbine was retrieved for inspection and maintenance. The machine was found to be in excellent condition, with only some minor modifications being made on internal components. These

maintenance activities took place using local workshops and labor, and the re-installation was carried out utilizing local vessels, operated by various companies based in Orkney. In its own right, this maintenance operation has provided extremely valuable experience and essential knowledge required for commercialization.

Since re-installation in late August 2013 the turbine has been operating continuously in a bid to prove its reliability. The original target was to operate continuously for 6 months, and export at least 1 GWh to the grid. At the time of writing, energy export is more than 1.2 GWh firmly surpassing the performance targets deemed necessary for the commercial operation of this technology.

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▼ Mobilisation at EMEC port



▲ Transport to test site



▲ Installation at EMEC site

TECHNICAL DATA

Type: HS1000
Output: > 1 MW
Rotational speed: 10.2 rpm
Rotor diameter: 21 m

